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IT is a pity that in this country the official investigation of such disasters as the burning of the Southern Hotel should be intrusted to bodies of so little weight as coroner's juries. The verdict which has been rendered in this case amounts to nothing more than an official statement of the popular opinion. It says that the fire originated in the basement storeroom or wine-cellar, and was communicated through the elevator. It censures the lessees for not providing and disciplining proper servants for the handling of their fire-apparatus, for keeping inflammable stores unguarded, and for not properly arranging for the awakening of their lodgers in case of fire. The suggestions of the jury strike us as remarkably feeble. They propose that all hotels shall be supplied with appliances for extinguishing fires, and gongs or bells for arousing guests, and with watchmen drilled in their use; and that building-inspectors shall look sharply after them in these respects. Their only suggestions of practical import are that storerooms, wine-cellars, and carpenter's-shops in hotels shall be made fire-proof, and that gas-meters shall not be allowed in them, which is well as far as it goes; that stairways and elevators should be as wide apart as possible; that elevators should close automatically in ascending or descending. All this scarcely touches the real necessities of the case. The provision of hose and fire-plugs is one which cannot be reasonably neglected, but can only be regarded as a forlorn hope. It cannot be hoped that in a hotel any service will be well performed which is not habitually rendered. To expect that their proprietors will maintain the abundant *personnel* and the discipline for emergencies that belong to a man-of-war is to expect what cannot be secured. If the safety of guests is the thing to be cared for, we can see no resource but in the improved character of hotel buildings. In behalf of this necessity we have scarcely heard a voice raised.

WE read of two associations of women for artistic ends which are taking form in New York and Cincinnati. That in New York is called a Society of Decorative Art, established with the twofold object of encouraging the production of such decorative work as women like to undertake, and of supplying women who need to work with an agreeable and remunerative way of doing it. We have not seen any account of the means by which this association proposes to accomplish its purposes, other than a general suggestion that it is by offering instruction for women who wish to learn to do decorative work, and by helping to find a market for the wares which they produce. There is so much interest in all sorts of decoration stirring among women, and so much demand for it in the community, and we may say, so much aptitude for it at work with very little intelligent direction, all over our busy country, that any movement which promises to turn these circumstances to a good account is to be heartily welcomed. The essential condition of its value however, is that it shall not be content to take things as they are, but shall lay its foundation in a sound and deliberate instruction of those whom it undertakes to befriend; and let it be understood once for all that it will not accept and assume to find a market for any but really good work. To increase the dissemination of the tidy but unskilful flower-paintings and poor pen-drawings that crowd our print-shops, or the uninteresting embroideries that our milliners sell, and which are tolerated only on account of the sex of those who manufacture them or the ignorance of those who buy them, is an undertaking not to be encouraged; it were better to form a society to confine them in the homes where they are produced and admired. There is ability enough and to spare for good decorative work, but it is not every woman that possesses it. That society will deserve well which shall devote itself to sifting the good from the bad, and enforcing the necessity of a really adequate training for the production of the good.

WHAT the really adequate training is, it is not so easy to say, and the means for it have yet to be provided, and in some degree to be devised. There is unquestionably much help in what the Cincinnati women propose to do with the assistance which they hope to evoke from the men. The title of their association is the Woman's Art Museum Association of Cincinnati; and their aim is the establishment of a museum on the South Kensington plan, for objects of industrial art of all kinds, and schools of training for draughtsmen and designers. We do not hear whether it is a part of their plan to limit the use of such a museum and school to women; but we should suppose not. The enterprise of the Cincinnati women in this undertaking is of a piece with the energy they have shown in the difficult art of wood-carving and in other decorative work, and such a museum as the South Kensington would look very much at home among them. It is questionable how far such means can carry art in advance of the taste of the surrounding people; but there is no better or more influential starting-point for the development of taste than among the women of a community.

THE *Chambre Syndicale des Menuisiers en Bâtiment* at Paris has offered through the Lord Mayor of London to present to St. Paul's Cathedral a sculptured pulpit, which shall cost from twelve to fourteen hundred pounds, in acknowledgment of the assistance given by English people to the French sufferers during the war of 1870. They propose to send a delegation to London to examine the place for which the pulpit should be designed, and to decide upon its form and character, in conference with the authorities there. The Lord Mayor, with suitable acknowledgments, referred the matter to the Dean and Chapter of the Cathedral, in whom the authority to accept the proposal rests. The courtesy is one for which the French themselves have perhaps set the only precedent, and which we should suppose the authorities of the Cathedral would be loth to reject. Yet, considering the many embarrassments that have beset all the projects for the decoration of St. Paul's, the difficulty and at the same time the importance of agreeing on a comprehensive scheme for it, and the wish, which it seems very necessary to resist, of all sorts of persons to try all sorts of experiments with it, it may be thought that there is danger in accepting an isolated piece of decoration. There is perhaps no important church in England in which a piece of French work would be so likely to appear satisfactory as in St. Paul's; but to accept a pulpit which should not, after all, prove to be at home in its surroundings would be awkward.

IT used to be a standing fling at the prosaic and non-appreciative Yankee, that he would, if he could, set Niagara Falls to turn a mill; but it is by a foreigner that the last and coldest-blooded suggestion of this kind is offered to us. It is probably pretty generally forgotten that the Niagara Falls Water-Power Company undertook twenty years ago to utilize a part of the power of Niagara, buying a site for a manufacturing village below the Falls, and digging a canal three-quarters of a mile round them to serve as a flume. The water-power thus secured has not been utilized, so far as we know; and at present the individual into whose

hands it passed, Mr. Horace Day, finding himself in danger of losing his privilege by foreclosure of a mortgage, is said to be negotiating for the sale of it to a Canadian company. But lately, at a meeting of the Iron and Steel Institute of Great Britain, Dr. Siemens, the president, made an address which attracted considerable attention, in which he reverted to the immense power of Niagara Falls, which, insomuch as men have not yet converted it to mechanical uses, he conceives to be wasted. He computes the power of the Horseshoe Fall at nearly seventeen million horse power; which is a pretty exact equivalent for what would be supplied by the present yield of all the coal-mines in the world. The immediate difficulty in utilizing the falls, besides the fact that they are not very kind to harness, is that the force is delivered at points where it is not convenient to use it, and the means of transferring it to points where it can be used to advantage are not yet at command. Dr. Siemens' suggestion is that dynamo-electrical machines, moved by the water, be used to generate currents of electricity which may be conducted to the necessary distances, and there made use of. He computes that a single three-inch rod of copper would convey a thousand horse power to a distance of thirty miles.

AT the risk of being set down as unbalanced sentimentalists, we must say that to us, as we fancy to most of the world, schemes of this kind are distasteful. It is not likely, to be sure, that in our day any serious attempt will be made to utilize the whole power of Niagara; and small supplies might doubtless be filched from it in such a way as not to injure its aspect. But studies of the capacity of its immense forces are empty pastimes if they are to lead to nothing more than the utilizing of such trifling fractions of its power as might be supplied by any of a thousand neglected watercourses throughout the country; while the mere ambition to bend a mighty work of nature to the service of man, for the sake of doing so, is a childish one. It is not conceivable that any considerable use could be made of the water-power of Niagara without injuring the magnificence of the fall and the beauty of its surroundings. The people of the whole country may be said to have a vested interest in it, which is too strong, and consolidated by too long usage, to be entirely subservient to the profits of riparian proprietors and speculators. It would be more reasonable that the General Government, which is honored for having set apart the Yellowstone Park region for an inviolable public ground, should extinguish by purchase the rights of those who own the shores of Niagara, than that it should allow it to be spoiled for the sake of speculative advantages. If it should happen by and by, that our sources of power were exhausted, the coal-fields given out and no substitute discovered for them, the lesser water-powers fully utilized, the winds and the solar heat found insufficient or unavailable, and the people in serious need of mechanical force, then the country might see the necessity of deliberately sacrificing to its daily wants the most splendid gift that nature has conferred upon it.

AT a meeting of a congress of learned societies at the Sorbonne in Paris last month, Mr. Waddington, Minister of Public Instruction, gave an account of a determination of the age of alluvial formations, by a French engineer, which promises to have important bearings upon historical and even geological chronology. The engineer, M. Kerviler, while making some excavations in the valley of the Loire, had discovered that the annual layers of alluvial deposit could, on careful examination, be counted like the annual rings in the trunk of a tree. The layers were from three to three and a half millimetres (say an eighth of an inch) in thickness, and each layer consisted of three thin strata, — one of vegetable detritus, one of clay, and one of sand; the vegetable matter being deposited in the autumn during the fall of the leaves, and the sand and clay during the summer and winter. The strata of sand which were distinctly to be seen gave the means of counting the layers, of which it was found that a hundred, representing the deposit of a century, occupied about thirty-five centimetres (13¾ inches). An opportune discovery gave an opportunity of putting the value of this way of estimating to a test. In excavating, M. Kerviler had discovered some coins of the Gallic emperor Tetricus, who was made emperor A.D. 267. A computation of the layers beneath which the coins were found gave the approximate estimate of A.D. 300. It is not to be assumed that such measures would determine historic dates with accuracy, but they would be of service in finding, with useful approximations, dates beyond the reach of history. Thus to certain bronze and stone implements which were found lower down, the date of 500 B.C. was assigned by computation of the deposit. Mr. Waddington proposes to give M. Kerviler the government assistance necessary to enable him to carry his researches through the thirty metres of alluvium which overlie the granite strata of the Loire valley.

BERLIN AND ITS BUILDINGS.[1]

BERLIN is as phenomenal a city as Chicago. It has not quite equalled the mushroom growth of Chicago; but its development is on the whole quite as astonishing, and is only paralleled in two or three of the most exceptionally favored American towns. For instance, at the end of the seventeenth century, Berlin, New York, and Philadelphia were small towns of about the same size, containing each five or six thousand inhabitants; at the end of the eighteenth the population of Berlin was in round numbers 180,000, that of New York 60,000, of Philadelphia 70,000; in 1871 Berlin had 828,000 inhabitants, while Philadelphia in 1870 had near 700,000, and the city proper of New York about 900,000. But it is the distinction of Berlin that while the other great cities of the world have owed their pre-eminence mainly to exceptional advantages of situation, Berlin has grown great in spite of what is apparently a most adverse site. In the midst of the alluvial plain of Northern Germany, on an insignificant, sluggish, and barely navigable tributary stream, in a rather sterile region of sand and marl, and not many feet above the level of the remote sea; with a forbidding northern climate; not immediately connected with any region of great natural productiveness, nor in any natural highway of communication, — Berlin is, one would say, signally destitute of natural advantages. It has apparently risen to its present condition by the sheer force of will of its rulers and people, and is a monument of the same steady firmness of purpose which has in two centuries raised the state whose capital it is, from an inconspicuous electorate to a kingdom of the first importance, and its sovereign to the most powerful emperor of our day. It is in truth a city as much made to order as were Alexandria and Constantinople, and unsustained by any such commanding merits of situation as they had. The city is not a very old one, its records running back to the beginning of the thirteenth century when two insignificant contiguous villages, Cöln and Berlin on the banks of the Spree, the nucleus of the present town, had probably but three or four thousand inhabitants between them. The former of these, on a little island enclosed by the river, was naturally from its more secure position the more important town during the stormy epoch of the Margraves of Brandenburg; and here in the middle of the fifteenth century, when the newly made Electors transferred their residence to the present capital, the second of them built the castle which, enlarged and rebuilt from generation to generation, remains the "*Schloss*" or sovereign's residence to this day.

The real prosperity of Berlin dates from the time of the "Great Elector" William Frederic, who in the latter half of the seventeenth century laid the foundation of the Prussian kingdom, fortified and improved the town, and established what became the Royal Library in it. His son, the first king, with less political ability than his father, devoted himself more to the embellishment of his capital. He admired, and during his rule as elector imitated as well as his slenderer means would allow, the lavish ways of his contemporary, Louis XIV. of France; though before the end of his reign, he reached the end of his purse. Under these two sovereigns the city increased enormously. Their policy encouraged an influx of foreigners, chiefly Protestants, from all sides; so that Berlin became known as a city of refuge, and between the accession of the father in 1640 and the death of the son in 1713, the population rose from 6,500 to 61,000. It is recorded that at this last date the number of houses in the town was 1,553, which gives a curious idea

[1] Berlin und seine Bauten. Herausgegeben vom Architekten-Verein zu Berlin. Mit 609 Holzschnitten nebst 8 Kupfer- und Karten-Beilagen. Zwei Theile. Berlin, 1877. Eigenthum des Vereins. Für den Buchhandel, Ernst und Korn. *B. Westermann & Co., agents for the United States.*

of the compactness of the population, showing an average of forty dwellers in each house. The crowding seems to have rapidly relieved itself however, for in another twenty years, when the inhabitants numbered 90,000, the number of houses had grown to 5,796. A view of the city in 1688, copied in the work before us from a print of that time, shows the principal thoroughfares of the centre of the modern city already closely built upon, and several of the oldest buildings now left are recognizable in it. The next king, the choleric father of Frederic the Great, maintained the family interest in his capital, dividing the little money he was willing to spend between his famous tall grenadiers and the streets of the city. He compelled the inhabitants to build according to his royal will: he laid out new suburbs, and expended upon his streets 250,000 marks and ninety thousand cubic yards of paving-stones. Frederic the Great found time amid his political and military cares to consider the extension and improvement of the capital which he neglected as a residence. Under him the present *Domkirche* was built, as also the original opera-house, and in the latter half of his reign, many buildings for military and civic uses. The population, which was checked in its growth and even diminished during his period of incessant warfare, recovered itself, and before his death in 1786 had reached 145,000.

The impulse and direction given to the city by the vigorous nursing of these successive sovereigns survived them; and the city seems to have continued to grow as if by its own momentum in spite of the check it received during the Napoleonic wars, and its occupation by the French. Its population, 180,000 in 1804, fell in the next six years to about 150,000, but in 1820 had risen to 200,000. In twenty years more it was as we have said 328,000, and its progress since has been almost unparalleled. Thus Berlin in spite of every apparent natural disadvantage, and the ravages of continual and often exhausting wars, was developed by the steady care of the Prussian kings, until it attracted by its predominance as the chief North German city, the accretions which its position would never have drawn to it, and grew by virtue of its own magnitude. It is a notable instance of the power over untoward circumstances — such circumstances as it is commonly thought impossible to control — of a firmly maintained purpose backed by the authority of a line of vigorous monarchs.

Firmness of purpose can make a city grand and imposing, but it cannot make it beautiful; and Berlin is not beautiful. There is a certain stateliness in the aspect of the more important streets; the general impression is one of coldness and formality. We speak the impression, be it said, of a traveller of half a dozen years ago, and Berlin may have changed somewhat in half a dozen years. It needs such a work as this which we have before us to remind one how much fine work there is among the immense number of its buildings, swallowed up, or overpowered in the general effect, by the mass of rather gloomy commonplace that predominates in its streets, as in truth commonplace of one kind or another predominates in the streets of every modern city. The architecture is more marked by formal dignity and balanced symmetry than by grace or elegance; and seems in some sort to reflect the reserved, unpliant, and rather cold character that we are accustomed to ascribe to the nation which produced it, with something of the disciplinary rigor of its sovereigns. Its characteristics are set forth with judgment in this sentence which we translate from the interesting introductory chapter that Herr Fritsch furnishes to the descriptive part of the book: "A clear well-considered distribution, a serious effort for organic connection of parts, a conscious moderation in detail, — these are the peculiarities which set the mark of kindred upon the artistically conspicuous buildings of Berlin, and at the same time constitute the superiority of its school of architecture. In truth, this thoughtful moderation, which not infrequently works meagrely and coldly, has assigned to the architectural creations of Berlin a certain limit in what may be accomplished, which is broken through only by the few pre-eminent artists in whom fancy and active reasoning powers are happily balanced." The formal traditions of the Renaissance have retained their influence in Berlin more than in almost any other city; the modern interest in mediævalism has not made any mark there. What slight attempts at mediæval style have been made have had an ill success which seems to show that they went against the grain. The freedom or license of eclectic fancy which has invaded the other transalpine cities of Europe has left but little trace in Berlin. The only influence which seems to have seriously modified the tendency to Renaissance design has been the Greek revival of the first quarter of this century, which, introduced with greater freedom and invention than belonged to the Berlinese treatment of the preceding Italian style, has since the time of Schinkel gradually leavened that with a spirit of greater elegance, and has produced in the hands of Stüler, Strack, Hitzig, Gropius, and other able men, some of the best work of our day.

Berlin und seine Bauten is a sumptuous octavo volume of nearly eight hundred pages, prepared under the direction of the Architectural Association of Berlin, and published by it, but bearing the well-known imprint of Ernst and Korn. It is handsomely printed, and illustrated with more than six hundred exceedingly well executed new cuts. It contains an historical sketch of the growth of the city; an introductory essay on its architects and architecture, from which we have already quoted; a classified account of its buildings of various kinds, old and new, as well as its engineering structures, liberally illustrated; and an essay on its building-materials and methods of construction. The preparation of the different divisions of the book has been assigned to different architects, and their work seems to have been done with judgment and thoroughness. The illustrations are well chosen and of admirable clearness. The woodcuts allow a profusion of illustration which would be impracticable with elaborate plates. They are as useful for suggestion as more pretentious engravings by which nothing of importance could be added unless details were shown; and this in a work of such scope is obviously out of the question. We commend to the notice of our readers this interesting book, of which we may find an opportunity to speak more in detail in a second notice.

STUDIES OF INTERIOR DECORATION.

VIII.

WE have developed, out of the essential conditions of the subject, an outline or theory for the completion of the dining-room shown on the plan in Plate IV. This theory embraces the following requirements: first, to have on the two long sides a symmetrical arrangement of opposite features; second, to connect these together by cross-beams resting upon dividing pilasters; third, to continue around the room the lines of the glass frieze in the partition which separates the dining-room from the drawing-room, as exhibited on Plate V.; fourth, to make this frieze dark in tone; fifth, to establish a dado and screen on the walls in contrasting proportions; and, sixth, to treat the room with rich low tones.

These requirements embrace all the essential conditions of decoration to be observed in this room. It seems to us that none of them have been forced into service for the sake of introducing a favorite *motif* — a temptation to which the artist is constantly subjected. His position in this respect is analogous to that of the poet, who, desiring to make the most effective and beautiful presentation of his subject, is embarrassed by the activity of his imagination, which tempts him to overlay his theme and smother it, as it were, under a profusion of figures and metaphors, until the unity of it is lost sight of, and he finds himself compelled to review his work in a spirit of painful self-denial. In like manner the mind of the architect is so compact of innumerable favorite details and *motifs*, that it is not easy to prevent these from becoming his master. No artistic result is possible under such subjection. Self-restraint, in fact, is necessary to all good design, especially while we are engaged in considering the outlines or general treatment of the subject. This, as we have seen, even in mere works of decoration, is a matter of serious consideration and analysis. Caprice, the play of fancy, may have its proper place in the filling in of these outlines at a later stage; but the outlines themselves in every case, whether on the outside or the inside of a building, are by no means to be lightly decided. In the case of this dining-room, we might have begun the work of decorating it by assuming that we would have a red or blue room, or we might have hit upon a certain style that we fancied; without stopping to consider what is really best to be done under the circumstances, we might have jumped at the conclusion that it would be a fine thing to make of this an Elizabethan room, cut up its ceiling with an arabesque of stucco, cover the walls with a panelled wainscot, and treat the chimney-piece monumentally with carved pilasters and a broken entablature; or we might have adopted the French Renaissance, and tried to recall an effect in some fine old château or hotel, that we have set down in our note-books as worthy of use when occasion offered; or, seduced by a brilliant interior of Talbert, by a study of Dresser, by a clever detail of Morris, by a Moresque fancy of Owen Jones, or by a painted wall-screen from

Japan, we might have strained a point to reproduce features which, however interesting in themselves, were invented to suit other conditions and surroundings. This, we believe, is the usual method of interior decoration; and to this inartistic method we may attribute the great misuse of opportunities, and the frequent unsatisfactory, commonplace, and incongruous effects which result from it.

In the first place then, our scheme involves, for reasons set forth in our last paper, a symmetrical arrangement of opposite features on the two long sides: to give full effect to this correspondence of parts, we divide these features into distinct unequal bays by pilasters bearing cross-beams which have a similar relation to both sides of the room. In order that the eye may more readily mark the relation between the beams and the pilasters, we connect them by curved and moulded braces. These constitute a salient feature, and there cannot be a moment's misapprehension of the object of them. It is true that they have no practical function of support, but they are an admissible feature of decoration, as they serve to emphasize and define the bays and to create an effect of unity. The central and most important bay has on one side the chimney-breast, on the other the sideboard; the adjoining narrow bays on each side of the central bay are occupied on the left with buffets, and on the right with the wings of the chimney-piece. The buffets are glazed and arranged for the accommodation of such fine china, glass, plate, and other enrichments of the table service, as without such accommodation would be lost on the higher shelves in the neighboring pantry; the portion of the chimney-piece which occupies the front of the chimney-breast is kept flat in order to avoid narrowing by a mantel-shelf that portion of the room which most requires available space, and the accommodation of the mantel-shelf is afforded in the narrow bays or wings on either side.

Our conditions require a dark frieze with vigorous lines of decoration. The treatment of this frieze must be influenced also by the fact that the room has an abundance of southern light, and masses of black walnut in the dado, furniture, beams, pilasters, and doors. The former consideration calls for a prevalence of cool colors; the latter affords an additional reason for dark ones to enhance the yellowness of the wood. These conditions would be more completely met by old tapestry equally woven with leather-colored and light-brown figures upon a *dark-green* background having almost the value of black. In the absence of tapestry we would, if possible, select a paper with a suggestion of texture, covered with fruitage and leaves, their natural growth stiffened so that the main movements of the stems shall be vertical, with horizontal branches, thus recalling the rectilinear outlines of each section of frieze. This dark rich mass is balanced by a panelled dado, distinctly wider than the frieze, having a carved belt against a black background, on a level with the eyes of one seated.

The drapery is of dead neutral or sage-green with a dark red or maroon band at the top, and a similar broad band at bottom, nearly coincident with the dado. These maroon bands are crossed with black or dark-green velvet, so as to break up the masses into irregular widths. The maroon is separated from the main green fabric of the curtains by black or gold-colored cords, — the former if the fabric is broken with damask figures, the latter if it is plain or merely ribbed. The valance is of the same material decorated with a heavy knotted fringe of darker green. The effect aimed at is an enriched coolness and soberness of tint; and the material should be something that will fall in soft folds, and rich enough, when drawn across the opening of the bay, to make an interesting background.

Further to enhance the yellowness of the wood we would treat the panels in the sideboard with flowers or figures in natural colors, upon a dead black background. The recess in which the sideboard and buffets sit should receive a maroon tone in the parts shown over their tops, and the glass buffets should be lined with red velvet to offset their display of household wealth.

As for the screen which occupies the greater part of the wall-spaces between frieze and dado, its function is to redeem this background which we are establishing from an absolutely absorbent heaviness. This result we would obtain by occupying it with buff leather tones broken up with such a diaper as will enrich the surface without making it gay. Against this let us suspend our choicest faience and maiolica.

In the whole treatment of the vertical surfaces we are governed by the fundamental condition that they are to form a background for the table when set in full array, and for such wealth of pottery as we may have at command. In the ceiling between the beams we would repeat the neutral yellow of the screen surface, but in clearer or cleaner tones with border-lines of red and dark green, the former predominating.

This description may serve to give to the sixth plate of our series the life and significance of color without which the forms are dead. To this symphony, there is essential the weight of an Oriental carpet with a firmly marked border and a central mass broken up into figures which no one can look upon and remember, — the work of looms which seem to express in color and form undecipherable mysteries, traditions of ancient harmonies. In the fabrics of Western nations, form always competes with color in interest; form is a conscious element in the work. But in the best Eastern carpets and rugs form and color are so combined that one is essential to the other; they cannot be separated without becoming incoherent. This is the secret of their beauty and usefulness as decorative agents. It would be desirable in such a room as we are imagining, to select a carpet in which no color shall *predominate* which does not appear upon the walls. This eschews blues and reds in quantity but admits them in subordinate capacities. If we use a Western carpet its field should be made up mainly of olive or brown figures upon a sage-green ground, with a distinctly defined border having a predominance of black. We consider it a common error to have the same colors prevailing in border and field; the former, to have its proper value as a boundary, should evidently be in contrast with the latter, and the decorations of the field, as we have heretofore insisted, should be such as to be read equally well from any point of view and to lose none of their value where accidentally covered by furniture. Perhaps if the Japanese device of disposing figures unsymmetrically and apparently accidentally upon the field could be transferred to carpets, they would gain a quality of decorative usefulness which must be wanting where the figures are equally and symmetrically distributed on a geometrical basis. Indeed, it would seem to be a proposition worthy of consideration, that in surface treatment wherein the forms have at least an equal value with the colors, a field occupied with symmetrical decoration, that is, with forms having a geometrical relation, should not be used, either on wall or floor, in positions where any portion of it is likely to be covered; for the peculiar value of such a decoration consists in the fact that the regular and orderly relation of the parts to the whole, of the centre to the border perhaps, or of the details to certain regularly recurring mathematical lines or points, whether expressed or implied, is understood at a glance. This can hardly be the case if a picture in the one case or a piece of furniture in the other so conceals the field that these relations cannot be felt or understood. An unsymmetrical decoration on the other hand, such as is common on a Japanese panel, plate, or screen, seems devised to meet this condition of use without loss of any essential decorative value. This is instanced especially in the background of Japanese pictures. Where, however, the forms in surface treatment have a less value than the colors, as in diapers and damask designs, or where the figure is very small, it is evident that the condition of symmetry is too unimportant to be affected by this proposition. H. V. B.

THE ILLUSTRATIONS.

COTTAGE AT NEW BRIGHTON, STATEN ISLAND, FOR ALEXANDER J. HAMILTON, ESQ. MR. BASSETT JONES, ARCHITECT.

(41 West Seventeenth Street, New York, N.Y.)

THIS cottage, now nearly completed, is situated half-way between New Brighton and the Quarantine, on the Shore Road, and stands on the slope of the hill, about fifty feet above the level of the water. The frame of the house is supported on solid stone foundations, with a large cellar under the central portion. The first floor is laid double with felting between. The first story is divided into a parlor, dining-room, serving-room and china-closet, kitchen, store-closet, water-closet, and hall. The second story contains four bedrooms (the principal one extending out over the veranda), bath-room and water-closet, and six capacious closets, fitted up with shelving, etc. The servants sleep in the attic. The frame is covered with diagonal boarding, felting, and novelty siding, and the roof with shingles. There is a ten-thousand-gallon cistern outside, with a filter. The water is forced up to the tank through the pump in kitchen, to supply the water-works. The building, when completed, will cost $4,800. The work was done by Messrs. Thompson and Fetherstone, of New Brighton and Stapleton.

GARDENER'S COTTAGE AND STABLE, FOR WILLIAM KREBS, ESQ., STATEN ISLAND. MR. BASSETT JONES, ARCHITECT.

(41 West Seventeenth Street, New York, N.Y.)

This building stands almost on the edge of the bay, and faces the cricket-field, from which point the view is taken. There are several features yet to be added before the building is finished. The style both of the cottage and stable is a somewhat free adaptation of Queen Anne forms. Messrs. Thompson and Fetherstone were the contractors.

DESIGN FOR A REFORMED CHURCH, JERSEY CITY HEIGHTS, N.J. MESSRS. ROBERTS AND TAYLOR, ARCHITECTS.

(Newark, N.J.)

It is intended to build this church of brick, with open-timbered roof, covered with slate. The walls are to be faced outside with pressed brick, with white bricks laid in diaper patterns and ornamental bands. The estimated cost is $10,000.

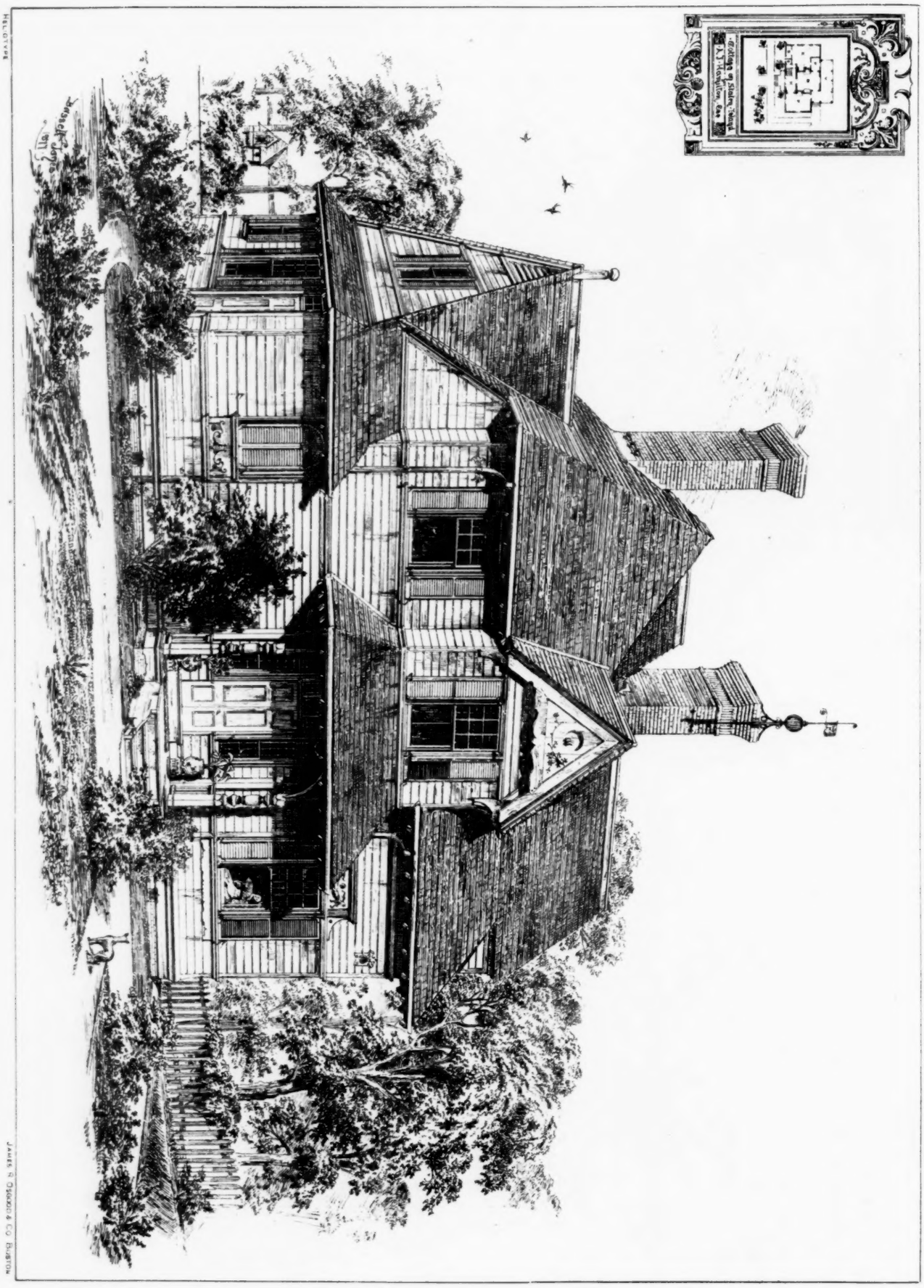
HOUSE FOR PROF. J. D. RUNKLE, BROOKLINE, MASS. MR. G. D. RAND, ARCHITECT.

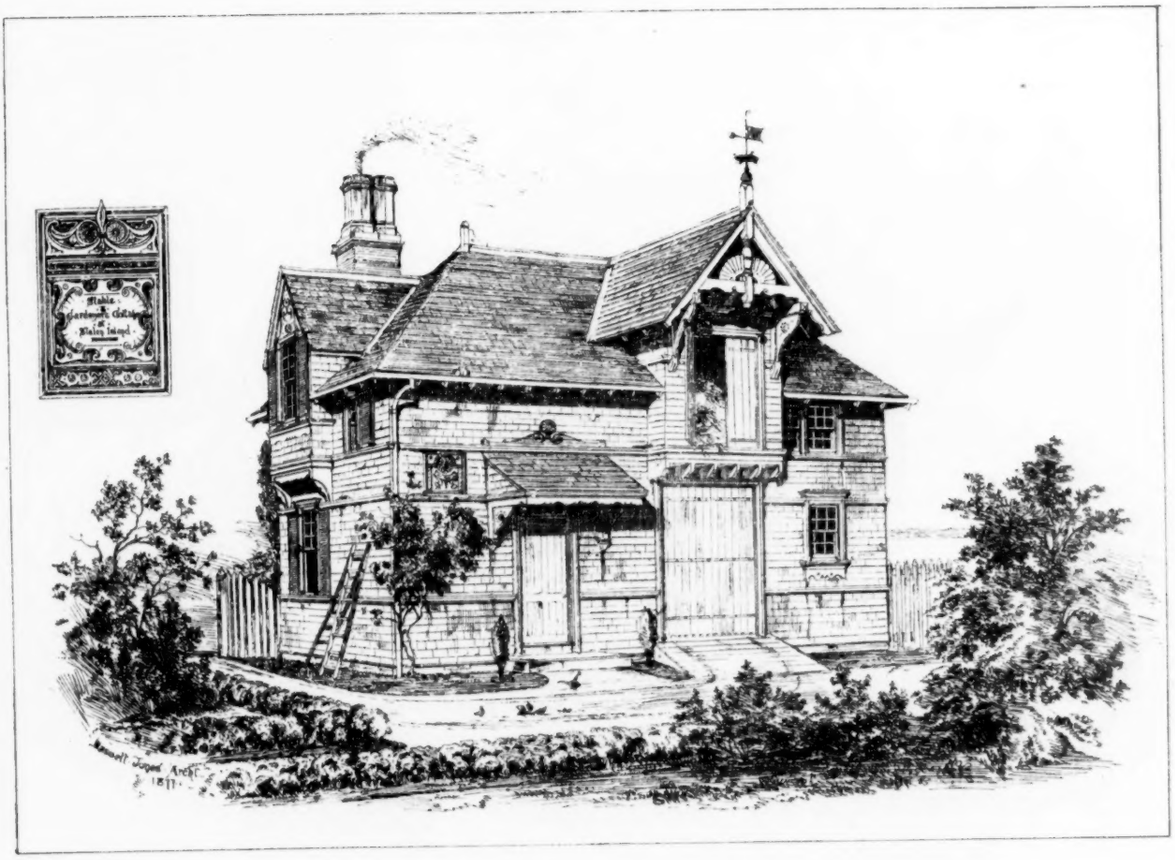
(15 Pemberton Square, Boston, Mass.)

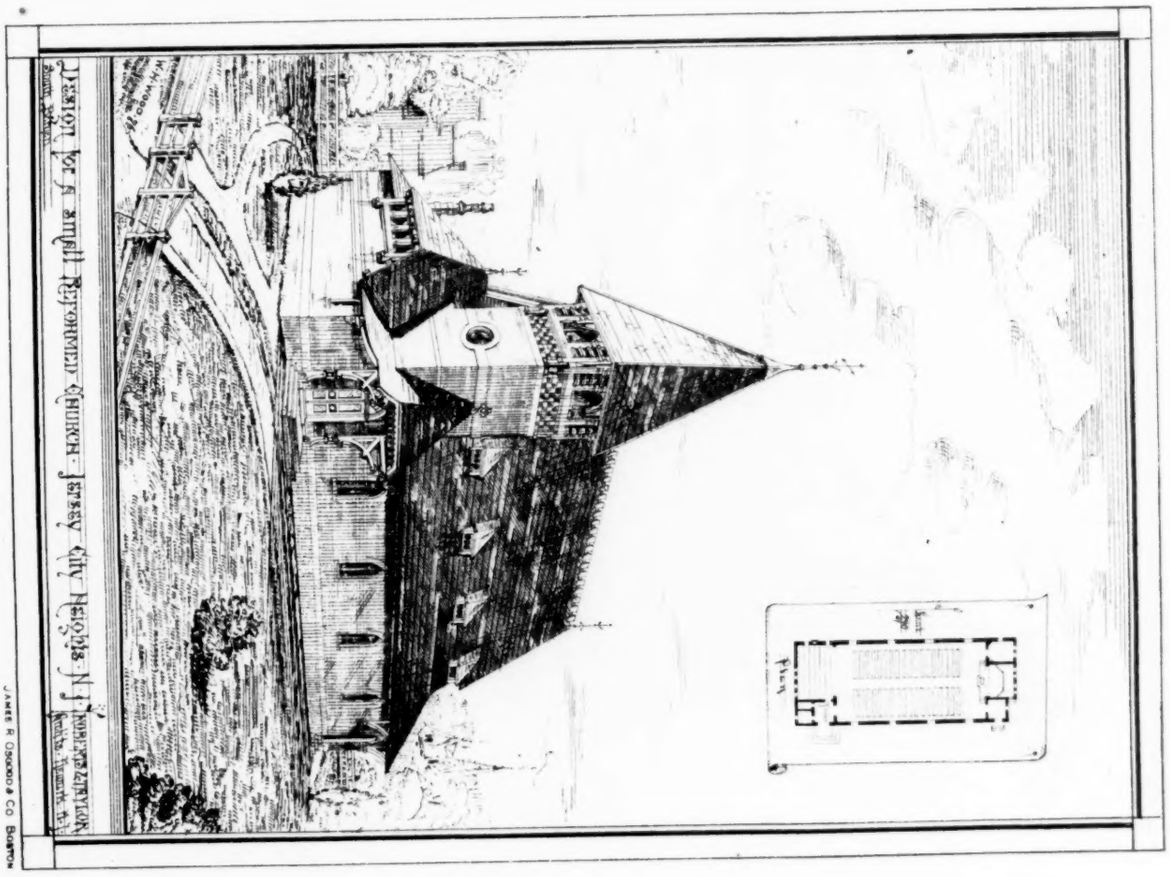
STUDY OF INTERIOR DECORATION. — VI.

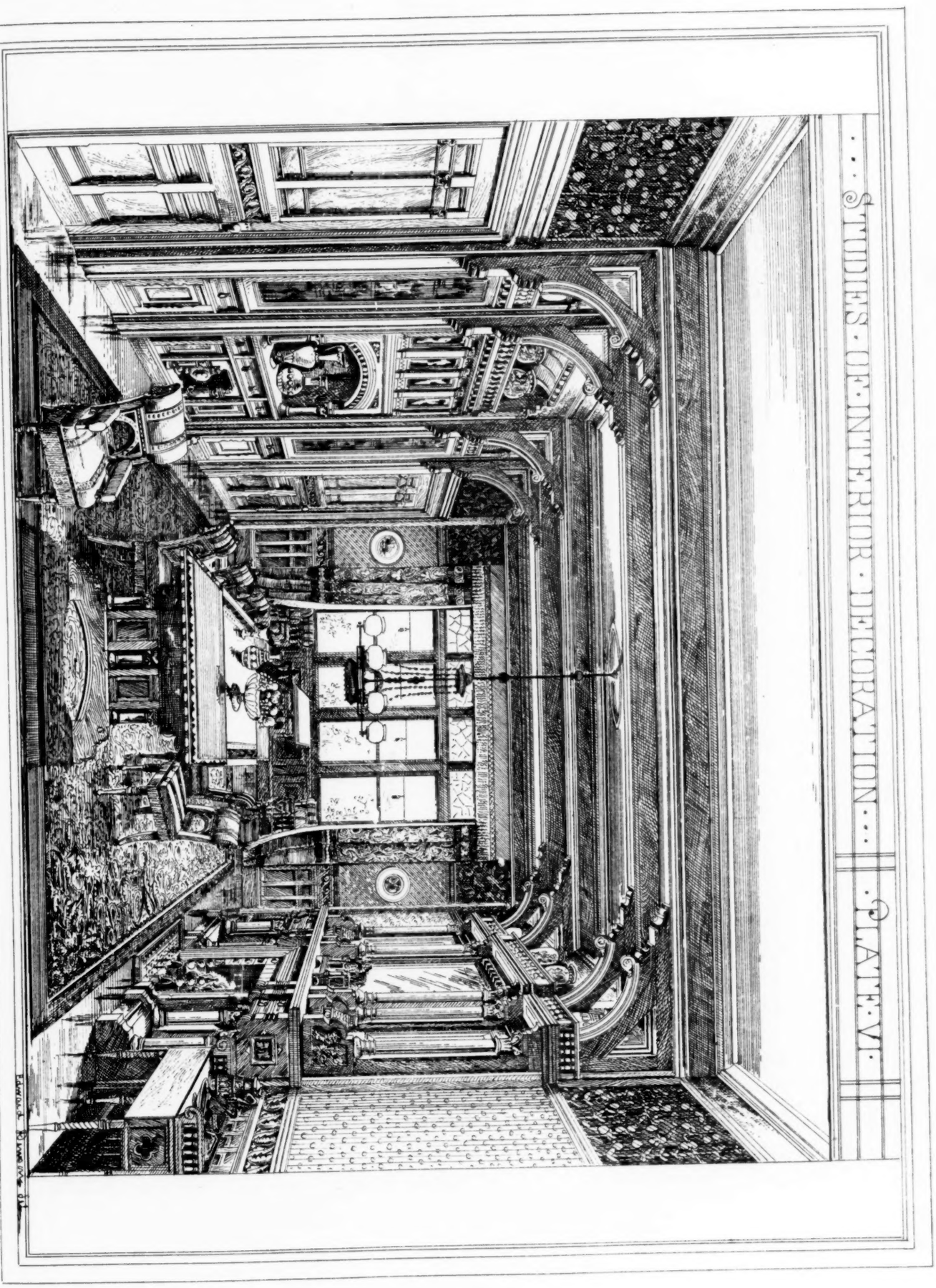
See the article above on this subject.

HOUSE FOR PROF. J. D. RUNKLE, BROOKLINE, MASS.
Willard & Hand, Architects
Boston, Mass.
Samuel J. Brown, Del.
First Floor Plan
Scale of Feet
Second Floor Plan
HELIOTYPE
JAMES R. OSGOOD & CO. BOSTON






DESIGN FOR A SMALL REFORMED CHURCH, JERSEY CITY HEIGHTS, N.J.
JAMES R. OSGOOD & CO. BOSTON



STUDIES OF INTERIOR DECORATION. PLATE VI.

HELIOTYPE

No. New York. Oct. 1876.

Edward Brown Arch.

JAMES R. OSGOOD & CO. BOSTON

THE SANITARY CONDITION OF CITY HOUSES.[1] — II.

HUMAN ingenuity has been able as yet to devise no system for the disposal of all manner of liquid waste which is at once so inoffensive, so invisible, and so healthful as a well-arranged system of water-carriage removal. The unfortunate thing about it all is that it is easy to meet the requirements of the fastidious by such a development of the system as is from a sanitary point of view the worst possible. Marble-top wash-stands with silver-plated fittings, decorated china closet-bowls, planished copper baths set in cabinet work of hard wood, stationary trays in the laundry, and the brightest and handsomest workmanship wherever the plumbing is visible throughout the house, are too often, indeed it is hardly extravagant to say almost universally, the outward manifestation of the most pestilential hidden dangers. Art can hardly achieve more in the the way of luxurious appointments than is compassed by all of these details in a modern house of the best sort. The character of their finish has much to do with the estimate that the intending purchaser or tenant puts upon the house he examines, and they are the subject of some of the most minute of the architect's specifications. When we consider the interior construction and arrangement of the hidden system to which they belong, we approach a part of the subject concerning which the purchaser, the architect, and the tenant are too often ignorant and indifferent. Nor do the dangers which belong to the modern house drainage system cease when we pass the limit of private work, and come to the public sewer to and from which the house drains lead.

The sewer and the drain meet one imperative requirement of the community. They are hidden from sight, and their processes are not offensively manifest, as are those of the slush-bearing surface gutter.

It is often assumed, perhaps because of the name given to the air of which we hear so much and which is so widely destructive, "sewer-gas," that the difficulty lies entirely or chiefly in the public sewer, and that we have only to improve the character of this or so detach our private system of drainage from it as to prevent the transmission of its air.

It is probably true that no city of its age can rival New York in the defective condition of its brick sewers. They are too often badly planned, badly built, and badly kept, and they do unquestionably produce a vast amount of disease and death. We can by no means, however, charge them alone with all or nearly all of the harm that is done; for so far as the production of dangerous gas is concerned, the waste-pipe of the house itself, smeared from top to bottom with the foulest organic matter putrefying under the worst conditions, and with frequent variations of temperature caused by the entrance of hot and cold water, is at least a brave rival of the worst street sewer.

The lack of ventilation of even the best sewers of New York and of American cities generally makes it important that we shut off as completely as possible the communications between the air that they contain and the air of our soil-pipes. Were these sewers well made and properly ventilated, the suggestions about to be offered concerning the soil-pipe might be materially modified; but circumstanced as we are with reference to public sewer, we must arrange to use it only as a means for getting rid of our liquid outflow, and must provide for our security against injury from its poisonous gases by a proper construction of our own *cloaca minima;* that is to say, we must have no more to do with the public sewer than is absolutely necessary, treat it as a deleterious outside influence against which we must adopt safeguards.

There are still very many houses in all our cities in which lead soil-pipes are used. The experiments of Dr. Fergus of Glasgow have demonstrated in the clearest way the great susceptibility of lead to the corroding influences of the foul gases arising from organic decomposition. He cites a great number of instances in which even after a few months' use the action of these gases upon the material of the soil-pipe has perforated it through and through, and in some cases completely honeycombed a considerable area of its wall. This effect is produced by gases and not by the foul water, as is proven by the fact that the perforations are always at the upper side of the pipe, and never on its lower side where the water flows. It occurs along the upper side of horizontal and oblique pipes, and especially at the upper side of a bend as in front of a trap, for the reason that the lightness of the gas causes it to lie chiefly against these parts of the pipe. The perforations being at the upper side of the pipe, they are not manifest by the leaking out of water, as the conduit is rarely filled. Often where it is horizontal or oblique it serves only as a gutter, its upper side being largely eaten away.

Even the smallest perforation may become a source of the most serious danger; a mere pin-hole may permit the escape of such an amount of air from the pipe as to poison the atmosphere of a large room. The apertures formed by corrosion, however, are rarely so small as pin-holes, and they are not infrequently large enough to admit the finger.

In modern practice it is almost universal to use for the soil-pipe and the larger branch-wastes, cast iron in the place of lead. This material is not susceptible of perforation from the action of its contained gases; but as drainage works are constructed, it is often fed by numerous waste-pipes made of lead, which come to it from bath-tubs, wash-basins, butler's sinks, laundry trays, and urinals, and even the water-closet usually has a trap or a connection pipe of lead. All of these leaden connections are subject to the same liability to corrosion as is the lead soil-pipe itself; and in one sense they aggravate the danger, from the fact that perforations occurring in them are more likely to discharge gas into sleeping-rooms or into the more frequented parts of the house.

The especial adaptation of lead to the construction of these minor waste-water channels because of its flexibility, and the ease with which it is jointed, make it almost necessary that it should be used; but, as plumbing-work is generally constructed, it is used with more or less risk of danger.

The old soil-pipe was invariably a tight one, and was generally separated from the connection with the sewer by a trap. The air it contained was not only extremely foul, but it was subject to expansion on the admission of warm water and from the production within it of the gases of decomposition. This expansion *must* be relieved; and it invariably is relieved under such circumstances, by the forcing of that one of its traps which has the least head of water to be overcome. The air in a street sewer is generally subject to more or less expansion from the same source, and to compression by the entrance of large volumes of storm-water, and by the blowing of strong winds against its outlet. The pressure in this case finds its relief by forcing the weakest house-drain trap, and the weakest trap between that house-drain and the interior of the house.

It has for some time been usual in all complete plumbing-work to relieve the soil-pipe by carrying a small "stench-pipe" from its upper part, out through the roof of the house. This is generally a pipe of not more than 1½ or 2 inches in diameter; and in order to protect it against the admission of rubbish from above, it is either domed over, and perforated with a number of small holes, or its upper end is bent so that its outlet shall be turned downward. Where this pipe is not so long and crooked as to offer considerable resistance by friction, and where the perforations at the top are sufficiently large and numerous, it serves a good purpose in relieving the pressure of expansion. Under quite unfavorable circumstances it will still, probably, be easier for the pressure to relieve itself through this stench-pipe, than through any water-trap; and in so far as the danger comes from this cause, it is an effective device.

The more recent investigations into the nature of sewer-gas have demonstrated that in its poisonous condition it is the product of an obstructed decomposition; of fermentation, which Pasteur aptly calls "life without air." The atmosphere within the soil-pipe does not contain sufficient oxygen to supply the continuous decomposition, which is thus checked until the oxygen which it requires is supplied by constituents of the organic matters themselves, — a process which leads to a radical difference in the resultant gases. Instead of being a thorough destructive oxidation of the material, it becomes a putrefying decomposition, producing foul smelling and dangerous results.

That part of the soil-pipe which carries the waste of the butler's pantry and the kitchen sink is more or less charged with melted grease, which coats particles of food and of filth, and so shelters them from the action of the air, giving the same pernicious character to their decomposition.

[1] A paper read before the Public Health Association of New York, by George E. Waring, jun.

TOWN ARCHITECTURE AND MODERN PROBLEMS.

[A portion of Prof. Barry's Sixth Lecture on Architecture delivered at the Royal Academy.]

WE often hear laments on the extinction of good taste. All, we are told, is common and vulgar, and we are daily plunging into lower depths of artistic bathos. Railways and kindred inventions, which have done so much to increase the power of man over matter, are complained of as the executioners of art; and in the opinion of some, all that we have to do is to seclude ourselves from such base associations, and draw gracefully around us the garment of refined exclusiveness, before we bid a final farewell to a vulgar and pushing world.

This spirit is not uncommon; it finds vent sometimes in laments over all that has made our country great among the nations of the world, sometimes in pensive regrets over the color of a fabric or the pattern of a coal-scuttle. It may, however, be doubted how far such despondency is to be justified by facts; and, still more, how far it is likely to be profitable for improvement in art. We may start by agreeing that ugliness is common enough, without conceding that it must so increase as ultimately to overwhelm us.

Good taste, if not common among ourselves, has ever been the heritage of the few. Is there less of it at the present time? or is it the fact that the many have come more to the front, and that their requirements have thus acquired a special prominence? We are not able to assume that, even among the Greeks, good taste was common. The buildings which are left to us are precisely those on which we should expect to find that every resource of art had been lavished. Of daily life in ancient Greece we know little, and we cannot assume that it differed greatly from what our own would be under similar circumstances. Different times and circumstances lead to different manners; and the problems we have to

solve in this anxious and brain-busy nineteenth century differ as greatly from those which presented themselves in the morning of the world's history, as do the grave pursuits of a modern philosopher from the happy and graceful gambols of a child amongst her flowers.

Modern civilization may sometimes seem to repress individuality, and its progress to resemble the march of an army, treading steadily with a common step. But this is not the whole truth. If it be true that it is rarely given to one mind to strike out novelty of a startling nature, and conquer by the flash of genius, it may be remembered that our army of progress resembles a column which never retreats, and in which each backward rank treads in turn in the footsteps of the more progressive pioneers.

Now if it be true that we have fallen on an age of great scientific progress, it will not do for the architect to ignore hard facts, and to be forever yearning for an impossible resuscitation of the past. In the imitative art of painting, the artist may ignore the present if he will; he may people his canvases with gods and goddesses; he may breathe the air of Arcadia or Elysium, and only return occasionally to the base sublunary ideas of modern life when he needs to find a patron or to examine his banker's book. To an architect such pure abstractions are impossible. He must be of his own time, and has no claim to existence unless he ministers to its requirements. Men do not build in order to look at their work, but to use it. Happy is he who can combine beauty and grace with perfect fitness; for he is the true architect, and in him art and science have met together.

Students of art who intend to become practical architects should bear this well in mind, and should not allow themselves to be unduly discouraged by the gloomy prophecies of failure, in which too many indulge with a facility which they almost appear to think stamps them at once as authorities. The past is ransacked, and its styles of architecture are paraded before us. What, we are asked, is your style? Why do you not give us something new? The question to some extent answers itself. Men worked on formerly in ignorance of the progress of others. Now originality is hindered by the affluence of knowledge. The results of long and painful experience are secured with one grasp, and our historical knowledge is the main hinderance to possessing a style of our own.

Originality in architecture is not only limited by such considerations as I have endeavored to explain in a previous lecture, but it is also now, as it has ever been, the divine attribute of genius. Architecture, therefore, as an "art of utility," cannot depend on the rare and uncertain appearance of original genius, however gladly she will ever welcome its advent. She has to take note of the accumulated knowledge of centuries, to strive after beauty while insisting on utility, and to guide her proceedings always with common sense. Unfortunately for architecture it is an art which cannot be indulged in without a more or less considerable expenditure; and with the increasing price of modern labor it must, in the highest forms, be out of reach of the multitude. And bear in mind that the great principle of modern social progress is care for the multitude; and their interests are now rightly placed everywhere in the foreground. There may be, and no doubt will be, as fine works of architecture hereafter as have ever existed in the past; but they may be obscured by the vast numbers of lesser things which are brought into existence to supply the wants of the masses.

We often lament — and, unfortunately, with good cause — that whereas the workman of old took a pride in his work, and showed an individuality in it, we look too often in vain for the evidence of such principles in modern work. Some ascribe this result to the introduction of machinery, but this is probably to confuse cause with effect. It is the *demand for labor* which has raised its value, and has brought upon us the necessity for economizing it as far as possible by machinery and labor-saving inventions. The world has obeyed the Divine command to increase and multiply, and the question has thus been raised, Is half the population to be without shelter in order that labor may be lavished on the remainder? Modern civilization gives a clear answer to this question, and the architect, as the servant of the latter, must strive to bring his art within the scope of her behests.

We have seen that in mediæval times the hewers of wood and the drawers of water were housed in the roughest manner, and this was also the case with the common people and the slaves in Rome and Greece. We have too much reason to be dissatisfied ourselves on this point; but much is now doing to remove the reproach, and there is consolation in the thought that when evils are admitted by the public voice their cure or mitigation in this country is seldom far distant. When this has been done, when our people have become well lodged, when education has begun to gather in its fruits of temperance, self-respect, and culture, I cannot but hope that art will have something to show for its share in the good work, and something to contribute to its further progress. If for us architects the days of castle-building be over, we may find a work, less showy perhaps, but as really noble, in educating the taste of an emancipated people.

MYCENÆAN ANTIQUITIES. — The treasures of Mycenæ discovered by Dr. Schliemann are soon to be placed in the Polytechnicon at Athens, under the auspices of the Archæological Society of that city, where they will be easily accessible.

BOOK NOTICES.

IRON AND STEEL STRUCTURES.[1]

THESE are two different translations of the same book. The method followed until quite recently in determining the dimensions of the component parts of iron structures has been to divide the maximum stress upon any piece by the assumed allowable stress on the unit of area, and to take the quotient as the necessary area of cross-section. When the piece was cut away by bolts or rivets, allowance was made for this, and the net or reduced area only was taken into account. Dr. Weyrauch very reasonably objects to what he assumes as the usual method of applying the above formula; viz., the assumption of the same allowable stress on the unit of area, whether the stress arises from tension, compression, torsion, or shear; and also whether it results from a constant or *dead* load, or from the repeated applications of a moving or *live* load, producing in many cases alternate stresses of opposite kinds. It seems unnecessary to state that such is not the practice of American engineers. Every boy, in breaking a piece of wire, bends it back and forth, instead of uselessly expending his strength in a dead pull; and yet Weyrauch intimates that previous to 1858, when Wöhler made his experiments, it was assumed that a body which could safely sustain a certain stress could resist the same stress, if indefinitely repeated. If this be so, what is the meaning of the terms, "proof strength," "working strength," and "ultimate strength," and the large factors of safety universally used?

Wöhler's law is thus enunciated: "Rupture may be caused not only by a steady load which exceeds the carrying strength, but also by repeated application of stresses none of which are equal to this carrying strength. The differences of these stresses are measures of the disturbance of the continuity, in so far as by their increase the minimum stress which is still necessary for rupture diminishes." The object of this treatise is to deduce formulæ based upon Wöhler's law, and the results of the latest experiments, by which the dimensions of all the parts of an iron structure can be rationally determined. The effect of phosphorus, sulphur, and varying proportions of carbon is discussed, as well as the mechanical treatment of tempering and annealing. Several chapters are devoted to riveting. Any attempt to apply theory to rivet connections must be based upon arbitrary assumptions. If we suppose the bars which are connected to be inelastic, then, except for the very great friction caused by the back rows of rivets, all the stress must be borne by the first row. Who can say how this stress is distributed over the back rows in consequence of the elasticity of the material, or the imperfections of workmanship? We can only rely upon the results of experiment.

While students will always desire to know upon what reasoning a formula is based, instead of simply adopting it, and working out results by mere substitution, practical men prefer a simple formula, or a table of results for reference. The latter class will not be likely to regard Dr. Weyrauch's book with much favor; the former may study it with profit.

In paper and typographical execution Wiley's edition is the superior, while Van Nostrand's translator presents the subject-matter in language which is much more terse, pointed, and forcible.

A PRACTICAL TREATISE ON HEAT.

No technical work that we know of better deserves its title than Mr. Box's treatise on Heat,[2] which has come to be accepted as one of the standard English authorities on the subject, grounded as it is in a great measure, on Peclet's famous *Traité de la Chaleur*. The first edition appeared in 1868, and during the past winter a second edition has been issued, which is based upon the first one, but to which valuable additions have been made in the chapters on Evaporation, Heating, Liquids and Air, Ventilation, etc. Any one who having a building to heat or a room to ventilate may refer to this work, hoping to find in it full directions of the course to be pursued in his particular case, will be disappointed. It has not been the object of the writer to stunt the faculty of ratiocination in his readers by an exhaustive series of explanations of treatment to be followed in all cases likely to arise in the practice of engineer or architect, but rather to stimulate it; for while considering the subject practically, he bases his reasoning consistently on theory, leaving the reader to work out his own conclusions. The book has the great advantage for the mass of readers of being couched in plain language, while its calculations and formulas are expressed in arithmetical and not in algebraic language; and for this reason alone deserves to be considered as one of the most conveniently practical of technical works.

In the treatment of those subjects in regard to which an architect would be likely to consult the book, as when he wishes to inform himself as to the best way to heat or ventilate a building, there is perhaps something to be desired in the form of a summary of methods and practices to be followed in ordinary cases, as well

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[1] Strength and Determination of the Dimensions of Structures of Iron and Steel. By Dr. Ph. J. J. Weyrauch. Translated by A. Jay Du Bois, Ph.D. New York: John Wiley and Sons, 15 Astor Place.

[1] Strength and Calculation of Dimensions of Iron and Steel Constructions. Translated from the German of J. J. Weyrauch, Ph.D. New York: D. Van Nostrand, publisher.

[2] A practical Treatise on Heat as applied to the Useful Arts, for the Use of Engineers, Architects, etc. By Thomas Box. Published by E. and F. N. Spon, London and New York. Price $5.00.

as a corresponding group of the practices and devices that are to be shunned as being useless or of positive injury. But a careful reader will find after perusing the work, that he is in a position to deal intelligently with the problems he may encounter in his practice, and, understanding the principles of thermostatics and aërostatics, to weigh the merits of the devices and apparatus that practical inventors may bring to his notice, and have confidence in the judgment that he may form of them.

CORRESPONDENCE.

THE PERMANENT EXHIBITION. — THE MERCANTILE LIBRARY. — EXHIBITION OF THE ACADEMY OF FINE ARTS.

PHILADELPHIA.

A SLIGHT confusion of names and titles appears to exist in connection with the approaching post-Centennial show; for while the papers have been all along referring to it as the "Permanent Exhibition," and under this head have announced the programme for the order of ceremonies, the invitation to these opening ceremonies does not in any way suggest permanency, but calls it "The International Exhibition of 1877." The opening which is announced for the 10th of May will be, so far as the arrangements go, very similar to that of a year ago, — much the same distinguished guests, rather less chorus, and no doubt a decidedly smaller audience.

Great exertions are being made to obtain subscriptions to the stock, which appears to be held mainly by large wholesale business men in this city, to whom the unexpected decision of the Supreme Court in the matter of the Centennial loan was rather a damper.

It may not be out of place to mention that the architect and engineer of the Main Building and Machinery Hall has received the decoration of "Nisham el Iptihar," from the Bey of Tunis.

Among the new attractions to the exhibition was to have been a set of small houses, intended to illustrate the styles of building and domestic arrangements of several European countries; but it has been found necessary with one exception to abandon this project for the present. The German cottage will be the exception, and will be located under what was known as the English Tower, and facing the new music-stand. The design is by Messrs. J. P. Sims and T. R. Williamson. It is to be of red brick and timber construction, with low pitch shingle roof. Within two of the angles are open porches, with small verandas above, the roofs of which will be arranged as a flower-bed. The house is very small, but also very clever in detail, and thoroughly German in general character. There are two rooms on each floor. A very effective open stairway leading out of the hall is supported by a sort of arcade of timber construction. The large open fireplaces will be of red and enamelled brick, and, owing to the location of the house, will stand very little chance of being used.

An honest and effective dwelling, somewhat in the style called domestic French Gothic, is building at the south-west corner of Fifteenth and Walnut Streets from Mr. Hewitt's designs. The base and belt courses and arches are of North River blue stone. The main portions of the walls are of the local pressed red brick laid in dark mortar, decorative bands being laid in maroon, blue, and buff enamelled brick. Quite a feature has been made by rendering the whole of the basement wall to a height of some four feet above the pavement level in dark enamelled brick. This will effectively prevent that portion of the house which usually receives the attentions of a school-boy's chalk and pencils from being disfigured. The elevations show a basement, two stories, and very plain curb or mansard roof. The dormers are all run up in brick, with stone cappings. The cornice being in moulded brick, the gutter of copper, and the slate roof having zinc finish throughout, the building may almost be regarded as fire-proof so far as the exterior is concerned.

The repairs on the Mercantile Library are approaching completion. Almost the entire south side of the roof and ceiling have had to be restored. A view of the wreck after the fire suggested at least one valuable hint in the matter of roof-construction. This building was originally erected for a market-house. The roof was supported on curved lattice-beams acting as principal rafters; on these were laid heavy purlins, and on the latter the sheathing, and on this the tin. Until the building was bought by the Library this construction was all revealed; but when altered for its present use, a ceiling of lath and plaster was added to the under side of the purlins; this, it will be seen, allowed a succession of long air-spaces, which being opened in some parts by bits of falling wall and burning cinder, and not having been originally carefully closed off at the extremities, but too often opening into stripping or wall lining, gave the fire every facility for travelling from end to end of the building, without being affected by the water which was thrown on either roof or ceiling. Would it not be well worth while to stop off all such air-passages in buildings, or to provide some means by which their influence might be controlled or even utilized in cases of emergency?

On Monday, 23d ult., the Spring Exhibition of the Pennsylvania Academy of the Fine Arts was opened. The display can hardly be considered first class; and local, indeed, one may even say national talent, is conspicuously wanting. Not a little space is filled up with those pictures which the owners have consented to allow to remain in place after the close of the exhibition of the loan collection. Architectural designs rarely seem to find their way into these Academy exhibitions; and when we consider what a feature they form at the *Salon* in Paris, and at the exhibitions of the Royal Academy, London, to say nothing of their always being represented at the Academy of Design, New York, one naturally asks, Is the oversight due to the apathy of local architects, or to the disinclination of the Academy management towards that sort of thing? Almost the only architectural features of the present exhibition are certain large models in cork, — Windsor Castle with St. George's Chapel, the Tower of London, the Abbey Churches of Westminster and Melrose, Holyrood Palace, Stratford Church, and the Scott Monument, which are contributed by the cutter, Mr. Hoppin. It seems to be pretty well understood that Hans Makart's large picture, "Catherine Cornaro," which is still on exhibition, will again go begging for a local habitation, as it seems to be impossible to raise even a fraction of the sum demanded for its purchase.

The two works by the same artist well known by the photographs, the "Abundantia" (of the earth, and of the water), which hang in the entrance-hall, while not so large or imposing have even more merit in the fact that they are more truly pieces of decorative art; considerable portions of the background being gilded.

VENTILATION.

THE attention of the writer was called to an article, signed "Champlin," in the *American Architect and Building News* of March 31, on this subject, in which the "Tobin system" of ventilation is noticed with some approval; together with a reference to an opinion expressed by the present writer as to the application of the "system" to the Hall of Representatives, Washington, in a report which he prepared a year since on the ventilation of that hall. The concluding paragraph of the article referred to alludes to the present writer by name; and the last sentence reads, "I am not prepared to discuss the merits of this [the Tobin] system, but the architect who could not introduce Tobin pipes in a sightly manner must be wanting in constructive ability."

The information as to the ventilation of the Leeds Borough Police Court is quite meagre. All we know is that there exists a room of some size, not given, in which an unknown number of persons is usually collected for an uncertain length of time each day, and this room is supplied with an unknown quantity of air, through eight pipes which are five inches in diameter, located in different parts of the room, and which open into it four feet from the floor, and discharge self-induced currents of air of low but unascertained velocity. Coupled with this indefinite information are the averments that "no draught whatever is now felt in the room, except when one puts his hand directly over the open mouth of one of the vertical shafts, and the air inside of the court is as pure and sweet as out of doors." The information as to St. George's Hospital is more positive in degree. A ward containing nine beds has four tubes, which are semicircular in section, being half of five-inch pipes, and consequently have nine and a half square inches of cross area for each tube; through either of which the current is "*perceptible*" with some apparent variation amongst them as regards the velocity of entering air. "The air remains sweet at all hours with the doors closed."

With this modicum of knowledge as to the practice of Tobin's system it will be well to recur to Champlin's theory, which it may be accepted to have carried out. "(1) We must secure an ample supply of fresh air. (2) The vitiated air must be removed at once. (3) The air in the several parts of the room must be of uniform temperature. (4) There must be an entire absence of draughts." Applying these rules to the ward in St. George's Hospital, "ample supply" for a least quantity may mean 30 cubic feet of air to a person per minute in the coldest weather of winter, and 60 cubic feet, similarly, when the temperature of the external air reaches that point where doors and windows must yet be closed, and little or no interchange of air occurs at the cracks or through the walls of the building, and when the conditions of internal and external air as to quantity of moisture present do not invite the diffusion of aqueous exhalations. Assuming these quantities, and we can do no less, let us see what velocities of air are now requisite to proceed out of the four (half) tubes allotted for the nine beds. 270 to 540 cubic feet of air per minute must enter at four inlet mouths of 39.27 total area, — 815 to 1,630 feet velocity of flow per minute, for a self-induced current. 120 feet per minute for air of unaltered temperature is a perceptible current. It may be admitted that currents of air at these computed velocities would be *perceptible*, and in so far the observations at St. George's Hospital are not to be questioned.

Admit these blow-pipes to be effectual in the attainment of "sweetness of air at all hours;" let an equal number of them be supposed to be distributed over the surface of the floor of the Hall of Representatives, — four to each nine members, — or take two whole pipes in lieu of the four half pipes for the nine members, and there is to be furnished a five-inch stand-pipe in every sixty-four square feet, or interspaced at eight feet distance apart on the floor, while in the galleries the same pipes must be placed only five feet apart. After this statement for the position of these pipes, I

yet hold to the opinion they would be quite unsightly, and would prove a severe trial to the constructive ability of the architect.

But I think the fact of the sufficiency of the supply of air by means of these small tubes, without the resort to fans or pumps to force the delivery, may properly be questioned. The existence of the tubes both in the Leeds Borough Court and in the wards of St. George's Hospital may be indubitable; but it may be relied upon, if the air is sweet, some surreptitious supply insures the volume necessary. If the air in these rooms has uniform temperature from floor to ceiling, either some miracle has been performed, or the source of heat for the air below the mouths of the tubes is not the entering and supplied air. If there are no draughts, the velocity of entering air from the tubes and the consequent volumes of air introduced must have been much less than my computation for "*sweetness*," and not over one-fifth to one-tenth what is demanded by that computation. The constructive architect who will supply sixty cubic feet of air per minute to each of the members on the floor of the Hall of Representatives who occupies fourteen square feet of floor, and to each of the audience in the gallery of the same hall who has allotted four and a half square feet of floor, "without the flicker of a candle," will have solved the problem to every one's satisfaction.

I have met with many instances of *perfect* ventilation in various places, and have examined the methods by which they were attained. They have frequently followed some extensive but incomplete devices for supplying or exhausting the theoretical volumes of air requisite for health, which have been devised or operated with little regard to the comfort of the subjects for ventilation. The "Quest of the Sultaun Solimaun" in search of happiness has involved the catastrophe of my investigations. I did wish to clothe myself with the knowledge of how to accomplish a perfect ventilation without cost or care. They found the happy man; but, alas! Paddy had not a shirt to his back. The perfectly ventilated plan was devoid of air-supply.

These remarks are intended to combat the specific assumption or inference that the "Tobin system" has reached a development which would justify its use at the Hall of Representatives, with its enclosure of three lines of external wall, its crowds of audience, and its sessions of thirty or forty hours continuously. I have merely endeavored to support my pamphlet on the condition of the ventilation of this hall in 1876. I am tempted to add some comment on the views set forth as to ventilation in general. The writer has been for twenty years combating the notion of the poisonous or even deleterious nature of carbonic acid gas; and now all physicists have come to the admission that it is as harmless as water, and as unsuitable to breathe, and that the source of effluvia as well as of malaria in habitations is organic matter proceeding from personal exhalations accompanied by moisture. The carbonic acid gas present in any dwelling may be made *the measure* of vitiation, as the constancy of proportion in the open air admits of positive measurement or separation of the excess in any room or place, and this excess represents the precise quantity of exhalation not diffused at a certain time, and bears some, although a very indefinite relation, to the organic vitiation. Even carbonic oxide gas is overrated in popular chemical esteem as a source of danger. It rarely exists at all except at the top of a chimney, and when diffused in the small quantities emitted by imperfect combustion of gas or other lights, it is quickly modified into carbonic acid; and, on the other hand, its presence in excess has instantaneous effect in discomfort, nausea, or coughing, while the whiff of breath before these disagreeable incidents is not fatal or even dangerous. Carbonic oxide gas is by no means an insidious poison, and the observations made where it has been manufactured in large quantities as a basis of illuminating gas have permitted its effects to be shown conclusively.

The question of the least size of room to be allotted for prisoners, for sick persons, to the poor, and to soldiers, is based not on ventilation, but upon the absence of ventilation to the greatest extent. How small a room practically unventilated will suffice? In the dormitories of the poor, the question of warmth only is considered; and nothing but habit or education will allow the cold bedroom which some vigorous mortals glorify themselves upon enduring. There are those who seriously question if the furnace-heated chambers, with enormous excess of air for ventilation, are as healthy as the old close cold rooms pre-historic to the anthracite coal era. All these questions open out trains of thought which it might prove entertaining to pursue, and they should be followed out by architects who have to provide for the ventilation and warming of buildings; but the length of this paper warns me to conclude abruptly. ROBERT BRIGGS, C.E.

NOTES AND CLIPPINGS.

THE OLYMPIAN EXCAVATIONS. — The latest discoveries at Olympia include a marble group of four persons, which is supposed to belong to the second century of the Christian era. Of the western pediment of the Temple of Zeus eighteen figures, and of the eastern pediment twenty-one figures, have been recovered, many of them, however, in a fragmentary condition. It is now conclusively shown that the Byzantine church, which stood near the Temple of Zeus, was erected on the site of the ancient Hippodameion, — temple of heroes.

CORNER-STONE LAID. — The corner-stone of St. Joseph's Cathedral at Hartford, Conn. was laid on the 29th ult., by Archbishop Williams, assisted by Bishops Conway of Albany, Shanahan of Harrisburg, O'Reilly of Springfield, Loughlin of Brooklyn, Galberry of Hartford, and some fifty priests.

A NEW CATHEDRAL. — The Episcopalians of Brooklyn are about to build a cathedral for Bishop Littlejohn, and they have now a bill before the Legislature to incorporate "The Cathedral of the Incarnation."

BRICKLAYERS' STRIKE. — The bricklayers of New York, numbering about 1,500, struck on the 30th ult., for an increase of wages from $2 to $2.50 per day. It is stated that twenty-seven firms have given the increase demanded. Four firms are reported as refusing the increase, and the men employed there have quitted work. The total number of men now out on strike is only 110.

THE HIGHEST RAILROAD BRIDGE IN THE WORLD. — The Cincinnati papers are giving accounts of the opening of the new Southern Railroad from that city to the Kentucky River, where there is said to be the highest railroad bridge yet built. It is 275 feet high, having three spans, the middle one 375 feet long, and the others 300 feet each, the total length being 1,125 feet. There is a bridge in Switzerland which is 254 feet high, but with span only 144 feet long, and one at Varrugas in the Andes, 252 feet high, with spans 125 feet long. The piers of this Kentucky bridge are the largest in the country, except those at Brooklyn, the stonework being 130 by 47 feet, and the base of the ironwork 117 by 28. The frame is all wrought iron, and was built out from the abutments toward the centre of each span. The fastening of the junction points was accomplished in a novel way. One sunshiny day having expanded the framework, the connecting bolts were fastened, and so much secured; then, a second day of sunshine having given all the expansion the bridge was capable of, the bolts were made fast permanently. At the opening the other day, the bridge was subjected to seven severe tests, and stood them all admirably.

THE NEW YORK COURT HOUSE CONTRACT. — The *Times* says it is charged that the New York Court House commissioners, while limited by the board of apportionment to expenditures of $105,000, have accepted contracts to the amount of $381,000 for the completion of the south portico and interior of the rotunda, including the supports of the dome. When this money is exhausted, there will, it is said, be an effort to procure a further advance from the city of $400,000 or $500,000 additional. Cost of the work will thus be augmented to nearly $1,000,000. The cost to January, 1872, when the work was suspended in consequence of the breaking up of the ring, was $12,420,732.

THE REJECTED FATHERS. — The four statues of the fathers of the Latin Church, which the Dean of Bristol Cathedral compelled Mr. Street to remove from the north porch of the cathedral which he was restoring, have at last found a resting-place (one might in view of their position say a roosting-place) on East Heslerton Church, Yorkshire, which has been restored by Mr. Street at the cost of Sir Tatton Sykes. There is a saying that "every thing suffers by translation but a bishop," which in this case is probably falsified, for the four figures are now used as terminals to the pinnacles at the top of the tower.

A PARALLEL CASE. — The circumstances that led to the removal of the statues of the Latin Fathers mentioned above have been paralleled in London where the Bishop of London refused to consecrate St. Agnes Church, Kensington Park, last January, unless a certain figure in the large stained-glass window above the chancel was removed. The figure was a full-length representation of the Virgin, surmounted by a crown of glory, and surrounded by a halo, placed side by side with a figure of the Saviour, also surrounded by a halo. The objection was that in the figures as shown in the window, the same honor was shown to the Virgin Mary as to the Saviour. The objectionable figure was removed, the space was filled in with plain glass, and the church was consecrated. During the first week of April the figure was replaced in the window with the bishop's consent. The crown about the Virgin's head had disappeared, but the halo remained.

THE BINNENHOF. — The Dutch as well as the English are at present interested in the question of the preservation of ancient monuments, and several historic buildings are being carefully restored; amongst others the Binnenhof or Court of the Counts of Holland at the Hague, where took place the arrest and execution of the Grand Pensionary of Holland, John Van Olden Barneveldt, the chief founder of the Republic. The picturesque group of buildings in which is the Binnenhof dates from the thirteenth century. The Dutch Government have also undertaken the restoration of the ancient feudal castles of Bréderode, near Haarlem, and Muiden.

FIRE IN JAPAN. — One thousand houses were destroyed by fire in Tokio, April 6.

LET WELL ENOUGH ALONE. — It is related of Cardinal Antonelli, that when some well-intending though meddlesome member of the British Academy of Fine Arts at Rome discovered that drawing from the nude female figure as practised by members of the academy was against the law, he thought it would be a good safeguard to get a special permit from the cardinal. "*Figlio*," the cardinal exclaimed, "I was not ignorant that the female model posed in your academy; but you were perfectly quiet, your rules excluded Italians from membership, you made no scandal, and I was not obliged to know any thing about the matter. Now, however, should the practice be continued in future, I shall be compelled to close your school."